

REMARKS

Claims 1-4, 7, 9, 11-15, 18 and 20 are pending in this application. By this amendment, Applicants amend claims 1 and 11.

Claims 1-4, 7, 9, 11-15, 18 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kuroda et al. (U.S. 6,215,229), Wajima et al. (U.S. 6,274,968) or Sugiyama et al. (U.S. 6,160,462) in view of Tsuji et al. (U.S. 5,699,027) or Onishi et al. (U.S. 5,459,368). Applicants respectfully traverse this rejection.

Claim 1 has been amended to recite:

“A piezoelectric resonator comprising:
a piezoelectric resonating element; and
a first exterior substrate and a second exterior substrate laminated
over and under, respectively, on said piezoelectric resonating element;
wherein each of said first exterior substrate and said second
exterior substrate includes a multilayer substrate having at least one layer
of an internal electrode;
said first exterior substrate and said second exterior substrate each
includes a first substrate material layer which is liquid-sintered and a
second substrate material layer which is not sintered at the sintering
temperature of said first substrate material layer; and
**each of said first exterior substrate and said second exterior
substrate has a deflective strength of at least 2000 kg/cm².**”
(Emphasis added)

Claim 11 recites features that are similar to claim 1, including the emphasized features.

The present claimed invention includes a first exterior substrate and a second exterior substrate, each of which has a deflective strength of at least 2000 kg/cm². With this unique combination and arrangement of elements, the first and second exterior substrates have greatly improved accuracy and strength. This allows the thickness of the exterior substrates to be reduced. Accordingly, miniaturization and shortening of the piezoelectric oscillator are greatly improved (see, for example, the paragraph bridging pages 28 and 29 of the present application).

Kuroda, Wajima, Sugiyama, Onishi and Tsuji fail to teach or suggest any specific deflective strength for the exterior substrates thereof, and certainly fail to teach or suggest “each of said first exterior substrate and said second exterior substrate has a

Serial No. 09/740,913

December 17, 2002

Page 4

deflective strength of at least 2000 kg/cm²" as recited in the present claimed invention. In fact, none of Kuroda, Wajima, Sugiyama, Onishi and Tsuji teach or suggest that the deflective strength of the exterior substrates could or should be regulated to reduce the size of a piezoelectric resonator.

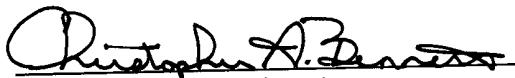
Accordingly, Applicants respectfully submit that Kuroda, Wajima, Sugiyama, Onishi and Tsuji, taken individually or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in claims 1 and 11 of the present application.

In view of the foregoing remarks, Applicants respectfully submit that claims 1 and 11 are allowable. Claims 2-4, 7, 9, 12-15, 18 and 20 depend upon claims 1 and 11, and are therefore allowable for at least the reasons that claims 1 and 11 are allowable.

In view of the foregoing Remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are respectfully solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,


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VERSION WITH MARKINGS SHOWING CHANGES MADE

1. A piezoelectric resonator comprising:

a piezoelectric resonating element; and

a first exterior substrate and a second exterior substrate laminated over and under, respectively, on said piezoelectric resonating element;

wherein each of said first exterior substrate and said second exterior substrate includes a multilayer substrate having at least one layer of an internal electrode; [and]

said first exterior substrate and said second exterior substrate each includes a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer; and

each of said first exterior substrate and said second exterior substrate has a deflective strength of at least 2000 kg/cm².

11. A piezoelectric oscillator comprising:

a built-in load capacitance type piezoelectric oscillator including:

a piezoelectric resonating element; and

a first exterior substrate and a second exterior substrate, which are laminated over and under, respectively, said piezoelectric resonating element, and which constitutes a three-terminal capacitor connected to said piezoelectric resonating element; wherein

said first exterior substrate and said second exterior substrate each includes a multilayer substrate having at least one layer of an internal electrode; [and]

said first exterior substrate and said second exterior substrate each includes a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer; and

each of said first exterior substrate and said second exterior substrate has a deflective strength of at least 2000 kg/cm².